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MEDICAL NEWS LETTER

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Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.

Nationwide Collaborative Mother-Child
Research Study

From Information Office, National Institute of Neurological Diseases and Blindness, NIH, Public Health Service, U.S. Dept of HEW.

Prematurity, stillbirths, and brain damage have been linked with some previously unsuspected events of pregnancy and delivery in a nationwide research study including thousands of mothers-to-be and their babies.

These findings—the first important results of a long-range collaborative perinatal research project—were revealed recently by Dr. Richard L. Masland, Director of the National Institute of Neurological Diseases and Blindness which is coordinating the project. The Institute is one of the seven National Institutes of Health, the major medical research arm of the U.S. Public Health Service.

"Although these are preliminary findings of continuing research and, therefore, should be viewed with caution," Dr. Masland said in recent hearings before Congressional appropriations subcommittees, "they may prove to be promising leads for future investigation."

Now in its fourth year, the collaborative project has compiled data to date on more than 23,000 expectant mothers and 17,000 children enrolled at fifteen participating medical centers. Analyses of these data have revealed the following early findings:

Premature births—an important cause of brain damage and deaths—occur more frequently among mothers who smoke than among nonsmokers. (Infants weighing 2500 grams or less were considered to be premature.) In addition, birth-weight was found to be inversely proportional to the reported amount of smoking. These findings confirm the results of previous studies which have shown a relationship between cigarette smoking during pregnancy and prematurity.

More than 40% of a group of infants diagnosed as abnormal at the 8-month psychological examination had suffered from breathing difficulties at or soon after birth.

In addition, Dr. Masland reported to Congress that individual investigators at the collaborating hospitals have published the following findings of special related studies:

In efforts to identify mothers who run a high risk of losing their babies, investigators confirmed the finding of a previous study that there is a close relationship between fetal deaths and certain alterations in the concentration of blood proteins of expectant mothers. These results may lead to the development of preventive therapy.

Additional evidence was uncovered to show that premature births may be caused by a symptomless urinary tract infection which cannot be detected by routine methods. Scientists at one of the collaborating institutions have devised a simple sensitive test for detecting this infection.

Investigators confirmed that infants of diabetic mothers weigh more than infants of nondiabetic mothers. However, postmortem studies showed that the brains of infants of diabetic mothers were comparatively smaller in weight and volume.

High rates of prematurity and infant death were found to be associated with findings suggestive of inflammation of the placenta, fetal membranes, and umbilical cord. In some 50% of cases where such inflammation occurred, infection of the vagina, cervix, or both was also present—a discovery which emphasizes the importance of careful treatment of these infections during pregnancy.

In studying the effects of an Asian flu epidemic on pregnancy outcome, scientists reported that this infection may affect the unborn child, especially if it occurs during the early months of pregnancy. Of particular importance was the discovery that nearly 40% of cases had no symptoms and could be diagnosed only by blood test.

A possible basis for early detection of brain damage in young children was provided by studies showing that prolonged lack of oxygen is followed by an increase in the permeability of the blood-brain barrier to certain enzymes. Brain damage may then be diagnosed by measuring the increase in these enzymes in the spinal fluid.

Improved technics were developed at one of the collaborating hospitals to detect brain damage in infants by means of brain wave recordings (electroencephalograms). Moreover, the use of visual stimulation in conjunction with these recordings is providing criteria for determining brain maturation at birth.

Related Studies May Produce Further Important Information.

Doctors expect the sample of 50,000 pregnancies to yield a relatively small number of defective children. (Of every 16 babies born, one is likely to have some neurological or sensory disorder.) To augment this number, data on groups of children outside the study known to be suffering from cerebral palsy, mental retardation, or kindred disorders will be collected from other patients in the collaborating institutions or from other institutions and agencies in the community.

Even though the information derived from these cases is not subject to the rigid controls applied to the basic study, the analysis of these additional cases may furnish valuable supplementary clues.

These institutions are also carrying out studies in areas related to the intensive over-all study. For example, the biochemical adjustment of the newborn during the first few days of life, and the relation of socio-cultural factors to pregnancy and pregnancy outcome are special aspects of the problem being investigated.

Research Holds Key to Better Child Health.

Some causes of neurological disorders are slowly being discovered, and some preventives. Important discoveries by medical scientists in recent years are:

(1) Inborn errors of metabolism that cause toxic effects on the brain are responsible for certain types of mental retardation. These biochemical defects result from a deficiency of an essential body chemical. If undetected and untreated, they can trigger mental deficiency. It is now possible to prevent mental retardation associated with such chemical abnormalities as cretinism, phenylketonuria, and galactosemia. Hopes are that mental retardation due to other inborn metabolic defects will respond to methods of control and prevention.

(2) Administering too much oxygen to premature infants can cause retrosternal fibroplasia, a disorder which once blinded 20% of all prematures. It has now been entirely eliminated—thanks to research.

(3) Maternal diabetes and German measles (rubella) during pregnancy are important factors which can influence the child's health.

Other findings emphasize the need for continued scientific investigation of the period surrounding birth. Research is the most promising course to reduce the measureless human misery and huge financial cost to our nation of chronic neurological and sensory disabilities of infancy and childhood. The Collaborative Project is giving national impetus to the search for a deeper understanding of the factors contributing to child health.

Medical institutions participating in the Collaborative Project with the National Institute of Neurological Diseases and Blindness are: Boston Lying-in Hospital and the Children's Medical Center, Boston, Mass.; Brown University and Associated Hospitals, Providence, R. I.; Charity Hospital, New Orleans, La.; Pennsylvania Hospital and Children's Hospital of Philadelphia, Penna.; Columbia University and New York Medical College, New York, N. Y.; Johns Hopkins University, Baltimore, Md.; Medical College of Virginia, Richmond, Va.; University of Minnesota, Minneapolis, Minn.; University of Oregon Medical School, Portland, Ore.; Yale University, New Haven, Conn.; Children's Hospital, University of Buffalo School of Medicine, Buffalo, N. Y.; and the University of Tennessee College of Medicine, Memphis, Tenn.

A new pamphlet published by the NINDB describes in detail the purpose and operation of this project. Entitled "The Fateful Months When Life Begins," the leaflet is available from the Public Health Service, Washington 25, D. C., or may be purchased from the U. S. Government Printing Office, Washington 25, D. C., for 5 cents a single copy, or \$3.25 per 100 copies.

* * * * *

Production of Congenital Abnormalities

Editorial from The New England Journal of Medicine 267: 566-567, September 13, 1962.

Congenital malformations and their causes have been under investigation for many years, the effects on the embryo of rubella in the pregnant woman, as revealed some decades ago, having stirred up special interest. Ingalls, Curley,

and Prindle in 1952, and Ingalls and Curley in 1957 reported in The New England Journal of Medicine the production of congenital abnormalities in the mouse by subjecting the mother to varying degrees of anoxia during her pregnancy. Such gross malformations as septal defects, anencephaly, irregularities and fusions of ribs and vertebrae, cryptorchidism, and cleft palate were produced by this method.

Warkany and Kalter, in a report of medical progress published late in 1961, indicated that 2 to 3% of all live-born infants show one or more significant congenital malformations, some of which are due to genetic and some to environmental influences. Rubella, until now, has been the classic example of an untoward environmental influence, with syphilis, toxoplasmosis, attempted abortion, especially with aminopterin as the agent, attempts to avert abortion with synthetic progestin, other drugs rarely and irradiation as suspected or proved causes. Anoxia seems not to have been involved in the production of abnormalities in human beings. A study of the possible effect of cigarette smoking in pregnancy has now been proposed.

The disastrous effects on the embryo of such an apparently harmless agent as thalidomide have naturally put the whole subject very much in the lime-light again, although the neuropathies known to have been caused by thalidomide indicate that it is not quite so benign as had been generally supposed. It has even been suggested that the embryonic defect may have been transmitted through the sperm of a thalidomide-consuming father.

It is probable, or at least possible, as noted by Woollam in the British Medical Journal, that many chemical substances may have the power of producing congenital malformations in the embryo when administered to the pregnant female at the right time and in the right amounts. It is obvious that the substance must be toxic enough to cause the deformity without usually killing the fetus, yet mild enough so that no apparent disturbance is ordinarily caused in the mother. It must, moreover, be administered at a stage in the pregnancy when rapid development of the structure involved is taking place.

A widely used drug, tetracycline, seems to be coming in for its share of discussion, especially in the British literature. Known to discolor the teeth and cause aplasia, the tetracyclines are now found to inhibit skeletal formation in the sand dollar and to find a resting place in the calcified part of the skeleton of the chick embryo, retarding bone growth and causing malformation. It is suggested that the same effect may be found in man under circumstances favorable for such an outcome.

Undoubtedly, the subject of congenital malformations is in for a thorough working over and all possible safeguards will be introduced, such as testing new drugs in pregnant animals before acceptance, and perhaps, legislation requiring reporting congenital deformities. The expectant mother should, from the first knowledge of her pregnancy, be encouraged to lead a normal life, protected so far as possible from illness and the ingestion of substances the action of which may be in doubt. It is important, however, to avoid the impulse to over react to the current drug scare by denying the expectant mother with serious illness well tried remedies that have not been clearly implicated as a cause of anomalies.

The First Six Weeks

Editorial. Journal of the A. M. A. 181: 131, September 22, 1962.

"By the end of sixth week of fetal life, when the embryo is barely a centimeter in length and the heart no bigger than a match head, it has all the external and most of the internal gross appearances of the adult heart." (1)

Why should the right ventricle and pulmonary artery be differentiated 8 months before a pulmonary circulation is required? Are there clinical implications in this early differentiation into a four-chambered organ? Grant has answered these questions through perceptive and highly original embryologic research. In a recent report this investigator described the physiologic adjustments to the heart's uniquely early development. He stressed that every mammal has two different double-circulations, one during fetal life and another during extrauterine life. Structural abnormalities in the heart are not as dangerous for the fetus as for the newborn, since in the former the two paths of flow of the double cardiac circulation are separated functionally, but not physically. The alternative fetal flow pathways provided by the patent foramen ovale and ductus arteriosus are not available after birth.

Another physiologic difference between the fetal and the adult heart was pointed out by DeVries and Saunders (2) who observed that in the early fetus the two ventricular chambers function as two pumps-in-series delivering blood into the truncus. "Later, when the interventricular canal is closed but the ductus arteriosus is open, they pump in parallel in driving blood into the descending aorta." (1)

Because of the remarkable rapidity of cardiac structural development, nearly all types of clinically important congenital heart disease are acquired within the first month of fetal life. The most severe cases of congenital heart disease die during these first few weeks of development. Only those cases where the cardiac deformity is compatible with the succeeding 8 months of intrauterine life survive to become part of the population of clinically recognized congenital heart disease. Statistically, then, the number of babies born with congenital heart disease may be a small percentage of all instances of congenital heart disease. The others died during the first month of life, manifested, perhaps, only by a slightly excessive menstrual flow. Grant's study of congenital heart disease suggests an incidence of intrauterine pathology heretofore unsuspected. "It is altogether possible that heart disease is responsible for more deaths during the first six weeks of fetal life than in any subsequent age." (1) Among the very young as well as in adult life, therefore, heart disease retains its position as the big killer.

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Liver Disease from Heat Stroke

Fernando G. Vescia MD, and Owen C. Peck MD, Palo Alto Medical Clinic
Palo Alto, Calif. Gastroenterology 43: 340-343, September 1962.

Heat stroke as a cause of liver disease is often neglected or ignored. The importance of this interrelationship has been described in several classical articles, and has been recently reviewed by Knochel et al, who reported a case in a young recruit at Walter Reed Army Hospital. The authors report on one such patient, documented with liver biopsy and enzyme studies, who made a good recovery except for relatively minor sequelae.

Liver injury from heat stroke occurs with surprising rapidity after the initial exposure. The hepatic insult has been known to produce centrolobular necrosis. Pathologic studies and liver biopsy examination in the present case failed to show extensive necrosis. The authors' specimen revealed focal collections of bile, focal areas of inflammation, and occasional mitoses. The first indications of liver damage were the presence of bile in the urine and elevated LDH and SGOT values. These were noted within 48 hours after admission. As far as the writers can determine, study of previous cases did not include these enzyme determinations. At the time these values began to fall, the serum bilirubin and alkaline phosphatase were still rising. Extensive centrolobular necrosis was not noted in this case; this may represent what separates the cases that recover from those that develop irreversible changes and go on to a fatal conclusion as noted in other series.

The ecchymoses and bleeding tendency were thought to be secondary to thrombocytopenia which frequently occurs with heat stroke. The causative factor of gastric ulcer was presumably of central nervous system origin secondary to hypothalamic lesions—the so-called Curling and Cushing ulcers. The extent of central nervous system damage was reflected by clonic convulsions, slow clearing of the slurred speech, persistent headaches, and hyperhydrosis, in contrast to the usual dryness seen in patients with heat stroke reported in other series. Persistent headaches as a result of heat stroke have been previously reported, but in this case the headaches—although slow in clearing—were transient in nature.

* * * * *

Urinary Tract Injuries: Sometimes
Occult - Always Dangerous

John J. Murphy MD. Editorial, Journal of Trauma, The American Association for the Surgery of Trauma 2: 532-533, September 1962.

Hidden away in the retroperitoneal space, covered by the intraperitoneal organs, and protected in large part by the rib cage and bony pelvis, the urinary tract is too often "out of sight—out of mind" of the surgeon responsible for the care of

an injured patient. The increasing incidence of high velocity—sudden deceleration accidents—has made the kidneys, bladder, and urethra a frequent part of the multiple injury picture. It is easy to understand why these organs are not thought of immediately when such a patient is first seen. The striking appearance of severe shock, the vivid picture of external hemorrhage and spectacular angulation of fractured extremities impress the observer and demand immediate attention, while the silent perirenal hematoma or urinary extravasation becomes apparent only after close and repeated inspections. Although injuries to the urinary tract may be less obvious than other lesions, their potential for serious threat to the patient's life soon after the accident and for severe disability later is exceeded by few.

Rapid exsanguination from laceration of the renal vascular pedicle constitutes a surgical emergency of the first order. Slower but continuing blood loss into the retroperitoneal space from a fractured renal parenchyma presents a problem which taxes the surgical judgment and diagnostic acumen of even the most skilled surgeon. It is important to remember that in health, each kidney receives 400 to 600 cc of blood per minute, and although the perirenal fascia together with the pressure of overlying viscera may slow the flow from a fractured organ, persistent leakage from such a lesion may result in the accumulation of more than a liter of blood in the retroperitoneal space before striking localizing signs or symptoms are apparent. Delayed hemorrhage from this injury is not uncommon, and the conservative management of renal trauma requires frequently repeated, prolonged, and detailed observation by a physician who must be alert to the possibility and signs of this catastrophe.

Disruption of the continuity of the lower urinary tract is less difficult to discover, but the possibility of this lesion in the patient with severe and multiple injuries must be kept in mind so that proper early treatment may be applied. There can be no argument about the value of, and imperative necessity for, urethrocytography when trauma to the bladder or urethra is suspected. Accurate delineation of the exact site and extent of a traumatic lesion of the lower urinary tract is simplified by this roentgen technic. Extravasation of the urine into the peritoneal cavity or retroperitoneal space may be detected late because the elevation of urea nitrogen, fever, ileus, and pain produced by this phenomenon are not sufficiently specific to suggest or localize the lesion. Early consideration of the possibility of a lesion which might produce this is the only solution.

The anatomic location of the urinary tract, while offering some degree of protection against moderate trauma, is a real disadvantage when injury occurs because it may hide the wounds of these organs and mask their signs by non-specific secondary reactions in the peritoneal or pleural cavities, until the process has progressed to a point where repair is difficult or impossible.

Everyone who cares for injured patients must remember these facts. Injuries of the rib cage or pelvis should suggest the possibility of damage to the organs enclosed by these portions of the skeletal system. Blunt or penetrating abdominal injuries should imply the likelihood of damage to organs outside as well as inside the peritoneal cavity. The necessity for roentgen study of any portion of the anatomy in the patient with multiple injuries should bring to mind

the simple, safe, and so informative excretory urogram. The value of this study in the management of patients with multiple injuries is so great that it should be part of the basic diagnostic evaluation in every instance. Retrograde urethrocystography and pyelography have inherent hazards as well as recognized value, but if one will think of the urinary tract and obtain the urogram, very few injuries will be missed.

* * * * *

Blood Clotting Factors

Leading article from *The Lancet* II(1962): 437-438, September 1, 1962.

Considerable agreement has now been reached about the chief factors involved in the clotting of blood—their functions, the properties by which they can be identified, and the conditions associated with their insufficiency. No important new factor has been reported since 1955 when that in a patient named Hageman was described by Ratnoff and Colopy (1).

A preliminary scheme for the naming of blood clotting factors was suggested by an international committee and published in 1959 (2). A system of roman numerals was to be used to distinguish those factors which—in the opinion of the committee—had been sufficiently established as distinct entities by definition of their physiopathologic, physical, biochemical, and chemical properties. This scheme has been generally accepted and most writers give the number of the factor they are discussing, even if they prefer to use a more descriptive name in the body of their paper. For example, they generally prefer to write about fibrinogen, prothrombin, and antihaemophilic factor, rather than factors I, II, and VIII. A more up-to-date list (3) includes details of eleven recognized factors numbered I-V and VII-XII; VI has fallen out of use since the existence of this factor is now doubtful.

Factor I is fibrinogen, factor II prothrombin, factor III thromboplastin, and factor IV calcium. These are the original components of the classical clotting system and their properties are well defined. The new factors, nearly all concerned in the stages by which thromboplastin is formed and activated, have been discovered within the past 20 years. Many have been discovered as a result of "correction" experiments. For example, factor V was discovered by Owren (4) in the blood of a female patient which showed a prolonged prothrombin-time, according to the one-stage test; since normal plasma from which prothrombin had been removed by adsorption corrected this defect, the deficiency was not of prothrombin itself. The factors which are important in thromboplastin generation are numbered as follows:

Factor V, also known as proaccelerin or labile factor; factor VII, also known as proconvertin or stable factor; factor VIII, which is antihaemophilic globulin; factor IX, also known in Britain as "Christmas" factor (an eponym from the first patient who happened to have the surname Christmas) and in America as P. T. C. (plasma thromboplastin component), and factor X, also known as the Stuart-Prower factor.

At present, "extrinsic" are distinguished from "intrinsic" thrombo-plastin systems. The extrinsic system is important when the clotting of blood follows tissue damage, whereas the intrinsic system is more important in the absence of such damage. The distinction is one of convenience because, as Douglas (5) says, both must play a part in physiologic haemostasis. The patient with pure factor VII deficiency has a defective extrinsic thromboplastin system but an intact intrinsic system; nevertheless, he has a haemorrhagic state. Similarly, the extrinsic system of the haemophilic patient is normal though the intrinsic system is deficient; but there is no doubt about the failure of haemostasis after tissue damage in such a patient. In the extrinsic system, tissue extract, calcium, factor V, factor VII, and factor X are involved; deficiency of any one leads to defective formation of thromboplastin. Factors VII and X are not consumed in the clotting process and are, therefore, found in the serum after clotting. They can conveniently be studied in serum where they are free from the factors which are consumed in clotting, but there is no reason to doubt their presence in plasma.

For the intrinsic system, calcium and factor V are required, together with blood-platelets, factor VIII (antihaemophilic globulin), and factor IX (Christmas factor); of these, only factor IX remains unconsumed in the serum. The coumarin anticoagulants chiefly affect the extrinsic thromboplastin system by reducing the concentrations of factors VII and X; but there is also evidence that factor IX (Christmas factor) of the intrinsic system is affected, and pro-thrombin (factor II) may be somewhat depressed. The Quick one-stage pro-thrombin-time test measures mainly the depression of factor VII, and to some extent factor-X deficiency; but it is insensitive to factor IX deficiency. Other tests have, therefore, been devised in an effort to provide a better basis for estimating the risk of haemorrhage in patients under treatment with anticoagulant drugs.

The "thrombotest" of Owren (6) was designed to give an estimate of deficiency of the factors VII, IX, and X; there is still some argument about whether it does accomplish this, and still more as to whether there is, in fact, any practical advantage in using a more elaborate test simply to detect the additional factor IX deficiency. Factor XI (also known, somewhat confusingly, as "plasma thromboplastin antecedent") may be connected with thromboplastin generation. Deficiency causes a syndrome like mild haemophilia which was first described by Rosenthal (7) in 1954. The condition is uncommon in this country (Britain); Biggs and Macfarland (8) discovered three cases among 187 patients with haemophilia syndromes, but Wilkinson et al (9) found none among 267 patients. Factor XII is the Hageman factor mentioned before; deficiency rarely causes clinical symptoms, but since the factor plays an important part in clotting changes after blood comes into contact with glass, its absence gives rise to abnormal results of clotting tests. There is no evidence that this factor is necessary for normal haemostasis.

This proposed system of roman numerals has not gone unchallenged. Many doubt the wisdom of substituting numbers for names that are well established and clearly understood. Stefanini (10) finds the number system a positive

hindrance when teaching or writing about haemostasis. The numbers have been assigned quite arbitrarily, roughly in order of discovery. Consequently, none bears relation to the phase of coagulation in which it is important. Factors bearing the higher numbers are important in the early stages of clotting, whereas factor I (fibrinogen) is involved in the final stage. Moreover, arabic numerals have been applied to platelet factors.

Another difficulty is that some of the newer factors are not very permanently characterized; once a number has been assigned to a factor, it cannot well be reassigned if further research throws doubt on the factor's existence, and a gap is, therefore, left in the numerical sequence. For example, factor VI (Owren's accelerin") no longer appears in coagulation schemes. A further example of this type of difficulty concerns factor IX; an important property of this factor is that it is not consumed in the clotting process but remains in the serum. Recently, however, Lewis and Nour-Eldin (11) have shown that this property is due to contact with water-wettable surfaces. If this is avoided, the factor is, in fact, consumed and does not appear in the serum. Do we now give the plasma form of factor IX a number of its own—perhaps XIII? Stefanini points out that, of the proposed numbers, only factor V and factor VII are generally favored above the descriptive names. He proposes a return to the original descriptive names—"labile factor" for factor V, and "stable factor" for factor VII. Platelet factor 3 can fairly be described as "platelet thromboplastic factor." There is much to be said for this suggestion.

Experts in blood clotting will have the factor numbers at their fingertips. But the subject is of interest to others—general physicians and surgeons, medical students, physiologists, general pathologists, pathologic technicians—and these nonexperts would surely find descriptive names—which can be easily explained and which bear some relation to the factor's place in the clotting mechanism—much more informative and easier to remember. The latest committee on nomenclature suggested that factors should be described either by number only or by the number with a descriptive name following in parentheses. Some articles have already appeared with the factor number alone in the title, and, to the uninitiated, such a title must convey little. Would it not be preferable for the title to contain the descriptive name followed, for those who want it, by the factor number in parentheses?

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MISCELLANY

Retirement of Captain Leo J. Elsasser MSC USN

On 1 October 1962, a long and distinguished career as an active member of the naval service was ended with the voluntary retirement of Captain Leo J. Elsasser MSC USN. Captain Elsasser began his naval career by enlisting as a hospital apprentice on 29 September 1930. He progressed through the enlisted hospital corps ratings and was commissioned in the Hospital Corps in 1942. During World War II he served overseas with a Fleet Hospital in the Pacific.

He was appointed in the newly created Medical Service Corps of the Navy in 1947, and was promoted to the grade of Commander in January 1955. He served as Administrative Officer of the Naval Hospitals, Chelsea, Mass.; San Diego, Calif.; and Great Lakes, Ill.; was the first director of the Hospital Administration Division, Bureau of Medicine and Surgery, Navy Department, Washington, D. C.; assumed the post of Commanding Officer, Naval School of Hospital Administration, National Naval Medical Center, Bethesda, Md., on 8 October 1957, and also served as consultant in hospital administration to the Surgeon General. He served on the Council on Planning, Financing, and Pre-payment of the American Hospital Association of which organization he is a member.

Captain Elsasser was appointed by the Secretary of the Navy on 1 October 1958 to be Chief of the Medical Service Corps, U. S. Navy, and Director, Medical Service Corps Division, Bureau of Medicine and Surgery. He is a member of the Advisory Committee of the Hospital Counseling Program, American Hospital Association.

Captain Elsasser's many accomplishments during his tenure as Chief, Medical Service Corps, are well known and recognized by all members of the Navy Medical Department. Under his inspiring leadership the Medical Service Corps has increased in size and stature and the officers of the Corps have demonstrated their ability to accept ever increasing responsibilities as part of the Medical Department team. Particularly noteworthy was Captain Elsasser's energetic action to upgrade the educational level of all Medical Service Corps officers. The results of his untiring efforts in this regard are made readily apparent by the expanded and improved educational and training programs now available for officers of the Corps. The benefits to the Navy, and particularly to the Medical Service Corps, resulting from Captain Elsasser's exceptional managerial and leadership abilities as Chief of the Corps will be realized for many years in the future.

On Friday, 28 September 1962, Captain Elsasser, with Mrs. Elsasser and many Bureau military and civilian associates in attendance, was honored

at a ceremony held in the Bureau of Medicine and Surgery. Rear Admiral A. S. Chrisman MC USN, Deputy and Assistant Chief of the Bureau, delivered the Captain's retirement orders, a letter of appreciation from the Surgeon General, and awarded Captain Elsasser the Surgeon General's Certificate of Merit for his outstanding service to the Navy Medical Department. Upon his retirement, Captain Elsasser accepted a position as a member of Gordon A. Friesen Associates, Inc., Hospital Consultants, Washington, D. C.

NOTE: During the week prior to his retirement, Captain Elsasser forwarded the following letter to all Medical Service Corps and Medical Service Warrant Officers of the U. S. Navy:

"In the flurry of activity attending my departure from office as Chief of the Medical Service Corps, there is yet time to reflect on the events of the past four years and their portents of what is to come. For future remembrance, it is well to record such thoughts at this time.

First and foremost must be the feeling of mixed pride and humility at having been chosen to lead such a splendid group of men and women. Only the most insensitive individual could fail to grasp the full import of this appointment and the solemn duty imposed to guide the careers of those fine officers who have given so much in their dedication to our purpose. Placed in this post of leadership, how could one fail to strive to mirror in himself the sterling traits of those outstanding people? Such an effort is far more significant and rewarding than any honor and acclaim which might come my way.

An extension of the above consideration is the large debt of gratitude I owe to so many for so much. The timely direction, cooperation, and assistance so freely given have been a sturdy support without which my own efforts would have been largely futile. The understanding of my superiors has been encouraging and the devoted hands of my assistants have ever been at my disposal. Most heartwarming of all has been the loyalty of so many members of the Corps who have so readily accepted counsel and guidance. Such trust and confidence have been my sustenance.

As pleasant as are the memories of the past, they must not obscure the hopes for the future. I am being succeeded by an associate whose obvious competence, interest, and intent augur well for the prosperity of the Medical Service Corps, and I know full well that all members of the Corps will complement the efforts of that able gentleman by their continuing drive toward greater effectiveness in the medical mission. They will strive for a deeper understanding of one another and of the varied individual and collective skills which are the hallmark of this fine Corps. Their allegiance will stand untarnished, and their spirit of self-sacrifice will be manifest wherever they serve. Only in these ways can the Medical Service Corps continue to deserve its rightful place in the Medical Department and in the Navy, and only thus can it make its full contribution to the well-being of our nation.

With these and a thousand other gratifying thoughts I close a chapter which will remain indelibly imprinted in my memory. I take leave, then, with a hearty "God Bless!" to all from whom I now part company.



L. J. ELSASSER

Captain, MSC, USN

Chief, Medical Service Corps

* * * * *

Captain Herrmann Assumes Office as Chief of the
Medical Service Corps, U.S. Navy

On Monday, 1 October 1962, at a befitting ceremony in the office of the Secretary of the Navy, Commander Robert S. Herrmann, MSC, U.S. Navy, was administered the oath of office as Chief, Medical Service Corps by Rear Admiral W. C. Mott USN, Judge Advocate General of the Navy. Mrs. Herrmann accompanied the new Chief of the Corps. In addition to the Secretary of the Navy, the Surgeon General, and Admiral Mott, other Bureau Chiefs, and senior officers and officials of the Navy Department witnessed the ceremony.

Later in the afternoon, the Surgeon General delivered an appointment to the grade of Captain to the new Chief of the Corps and, with Mrs. Herrmann's assistance, appended the new shoulder boards to Captain Herrmann's uniform to complete the promotion ceremony. Following this, the Surgeon General presented Captain Herrmann a letter of recognition of his outstanding performance of duty during the period of 17 May to 7 September 1962 while serving as Director of the Bureau of Medicine and Surgery Study Group to conduct the Bureau's review of the management effectiveness of the Department of the Navy. Approximately 150 military and civilian personnel from the Bureau of Medicine and Surgery and nearby activities attended this ceremony held in the Office of the Surgeon General.

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Freedoms Foundation Letter Awards Program

The Freedoms Foundation, Valley Forge, Penna., has selected the subject, "My Freedoms and My Responsibilities," as its 1962 Letter Awards Program. It is a particularly timely and well chosen subject. As citizens, we are well aware of the constant threat to our freedom in a world of conflicting ideology. As Navy men, we have a daily responsibility to help maintain that freedom with our mobile worldwide forces of sea power.

This program provides an excellent opportunity to exercise one valuable freedom that is denied to many people in many lands, freedom of expression,

and participation by all military personnel has been urged by the Chief of Naval Operations.

Members of the Armed Forces on active duty may participate by writing a letter of from 100 to 500 words on the subject listed in the first paragraph of this notice, and sending it to Freedoms Foundation, Valley Forge, Penna., (prior to deadline date of 1 November 1962). (The 101 cash awards vary up to \$1000 for the top winner.)

As a matter of interest, LCDR L. E. Barkley MSC USN, Code 7A (BuMed) was awarded the George Washington Honor Medal in 1961 for his letter on the subject, "My Vote - Freedom's Privilege," and in April 1962 was awarded the George Washington Honor Medal, together with a check for \$100 for his letter on the subject, "What I Can Do for Freedom."

—From: RADM C. L. Andrews MC USN
Assistant Chief for Personnel and
Professional Operations, BuMed

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ANNUAL MEETING

Association of Military Surgeons of the United States

The 69th Annual Meeting of the Association is being held at the Mayflower Hotel, Washington, D. C., November 12, 13, and 14, 1962. The registration desk will be open at 1:00 p. m., Sunday, November 11 and beginning at 8:00 a. m., daily Monday through Wednesday. The Program of the Meeting will be found in the October issue of Military Medicine.

All awards will be presented at an Awards Hour in the Grand Ballroom at 9:00 a. m., Tuesday, November 13. Award recipients will be recognized at the dinner.

The Annual Dinner will be held on Wednesday, November 14th. (Refreshments, 6:00 - 7:00 p. m.; Dinner, 7:30 p. m.) Dress is optional. The evening will be devoted to a delicious meal and outstanding entertainment rather than to speeches. Music will be provided by Stephen Lesieur's Orchestra. The impressive floor show will feature Barbara Dodd, the Pitchons, and Ben Bartell.

A program of activities for Women of the Federal Medical Services and members' wives has been arranged. Reservations should be secured at once, via air mail or telegram, from the Association office at 1500 Massachusetts Ave., N. W., Washington, D. C.

Reserve officers may earn retention and retirement points by attending this meeting. The meeting is acceptable for Category II credit for members of the American Academy of General Practice.

There is no registration fee. Bring Your Friends!

* * * * *

Eminent Medical Personnel Visit Norfolk *

Mr. Stephen S. Jackson, Deputy Assistant Secretary of Defense (Manpower) and Dr. Frank B. Berry, Deputy Assistant Secretary of Defense (Health and Medical) arrived at Norfolk, Va., on 27 September 1962, with high ranking medical officials for a two-day tour of local Naval facilities. While in Norfolk, the group held an executive session of the Civilian Health and Medical Advisory Council.

Dr. Berry is Chairman of the Council, a nationally and internationally recognized group of experts in the fields of medicine and dentistry called upon from time to time by the Secretary of Defense to advise on health and medical matters as pertains to the Department of Defense.

Vice Admiral Wallace M. Beakley USN, Deputy Commander in Chief, U.S. Atlantic Fleet, welcomed the party on their arrival at the Naval Air Station. Escort for the group during their stay was Captain John S. Cowan MC USN, Fleet Medical Officer.

Accompanying the nine members of the Advisory Council were Rear Admiral E. C. Kenney MC USN, Navy Surgeon General, and Rear Admiral C. B. Galloway MC USN, Assistant Chief of the Bureau of Medicine and Surgery for Research and Military Medical Specialties.

On 28 September, the visiting doctors were at sea aboard the attack carrier USS INDEPENDENCE to observe air operations. Later in the day they attended a briefing on the Atlantic Command and U.S. Atlantic Fleet which was presented by Rear Admiral Horacio Rivero USN, Deputy Chief of Staff.

On Saturday morning, 29 September, the Civilian Advisory Council met in executive session prior to visiting the nuclear-powered submarine USS SCORPION (SSN-589) in port.

Other members of the Council are: Dr. Kenneth B. Babcock, Director, Joint Commission on Accreditation of Hospitals, Chicago Ill.; Dr. John C. Brauer, Dean, School of Dentistry, University of North Carolina; Dr. B. Noland Carter, Professor of Surgery Emeritus, University of Cincinnati College of Medicine; Dr. Wilbert C. Davison, Trustee, The Duke Endowment, Charlotte, N.C.; Dr. Michael E. DeBakey, Professor of Surgery, Baylor University College of Medicine, Houston, Texas; Dr. Champ Lyons, Professor of Surgery, University of Alabama Medical Center, Birmingham, Ala.; Dr. James McCormack, Dean, Seton Hall College of Medicine and Dentistry, Jersey City, N.J.; and Dr. Joseph F. Sadusk Jr, Professor of Preventive Medicine and Community Health, George Washington University, and Director of University Hospital Clinics, Washington, D.C.

* From: Fleet Information Office, Atlantic Command and United States Atlantic Fleet, Headquarters of the Commander-in-Chief.

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Accomplishments by Medical Officers

CDR John H. Schulte MC USN has been accepted for Fellowship by The American College of Preventive Medicine. He is currently on duty in BuMed as Director of the Special Weapons Defense Division.

Maintenance of Shipboard Pest Control Equipment

It has become apparent that increased emphasis should be placed on shipboard care of pest control equipment, particularly compressed air sprayers. It has been reported that these sprayers are routinely stored while they still contain insecticides, and seldom show sign of proper maintenance. This practice results in corrosion of parts, destruction of gaskets, and the ultimate deterioration of equipment.

Hand and power operated sprayers and dusters should be cleaned regularly—at least once a week when used daily. Equipment used occasionally, or with a variety of chemicals, should be cleaned each time it is used. A detergent and water should be used to wash out sprayers thoroughly, paying particular attention to flushing the nozzle, valve, extension tube, hose, and tank. Following the detergent wash, the equipment should be rinsed with clear water and allowed to drain thoroughly.

Strainers are located in various places on sprayers depending on the type and make. They are usually found at the discharge tube, discharge valve, and at the nozzle. The strainers should be removed and back-flushed with water to remove all extraneous material. If this is not successful, it may be necessary to soak the screen in a solvent to dissolve the insecticide residue. The screen should be replaced if it cannot be cleaned or if it is damaged.

Valves should open easily and close quickly and tightly without leaking on the operator. Packing gaskets in the valve should be made of materials that are resistant to the chemicals being used and should be replaced as frequently as necessary to prevent leakage. If it is necessary to take a valve apart for any reason, the gaskets should be replaced at that time, since they may fail and are inexpensive.

Clean the hole in the nozzle tip either by back-flushing or with copper wire or a bristle that is softer than the material in the tip itself. The hole must not be deformed or enlarged during the cleaning process.

Check hoses for any breaks in the outer covering, especially at couplings or connections, and replace if any breaks are present. Never store a hose with sharp kinks in it; this will cause breaks in the inner liner as well as in the outer covering.

Maintain all plunger or piston cups in good condition. The rods and pistons which move the cups should be well lubricated and must move freely. Keep all bearings or gears clean and properly lubricated.

Dusters also require individual care. They should be emptied frequently and all caked or hardened dust should be removed. A stiff wire may be used to clean and scrape the sides of the tubes. Clear all small openings and screens. The above should also be done before the dusters are placed in storage.

Information on equipment maintenance has been obtained through special permission from the Correspondence Course in Pest Control Technology by Dr. Lee C. Truman, Purdue University, Department of Entomology, West Lafayette, Indiana.—Preventive Medicine Division, BuMed.

Military Section Sponsors Pharmaceutical Seminar

The Section on Military Pharmacy of the American Pharmaceutical Association will sponsor a Federal Services Pharmaceutical Seminar on 15 November 1962 for all pharmacists in the U. S. Government service.

The seminar, to be held at the National Naval Medical Center, Bethesda, Md., will feature presentations on the role of the pharmacist in handling investigational drugs, chemotherapy of hypertension, the role of radioisotopes in modern therapy, and insight into a cancer research program. Speakers will include Dr. Edward D. Fries of the Veterans Administration, Dr. Theodore J. Medrek of the John L. Smith Memorial for Cancer Research, and Dr. Arthur Osol of the Philadelphia College of Pharmacy and Science.

Dr. George F. Archambault, Pharmacist Director, U. S. Public Health Service, and President of the American Pharmaceutical Association, will open the program with a review of investigational drugs. CAPT Claude V. Timberlake MSC USN will preside over the morning session in his capacity as Chairman-Elect of the Military Section, and COL Ralph D. Arnold MSC USA will lead the afternoon program. Vernon O. Trygstad, Director of Pharmacy Service for the Veterans Administration will preside over a luncheon. The luncheon address will be delivered by Mr. Alanson Willcox LLB, General Counsel for the Department of Health, Education, and Welfare.

Pharmacists in the Federal Services who desire to attend the seminar should advise CAPT Timberlake no later than 5 November. Confirmation should be sent to CAPT Claude V. Timberlake MSC USN, Defense Medical Materiel Board, Potomac Annex, 2300 E Street, N. W., Washington 25, D. C. No fees are involved in attending the seminar.

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Nurse Corps Anesthesia Training Program

An Anesthesia Program for Nurse Corps Officers has been established at the Naval Medical School, National Naval Medical Center, Bethesda, Md. This program is designed to help meet the anesthesia needs of the Navy Medical Department by preparing Nurse Corps officers to serve as Certified Registered Nurse Anesthetists.

The 21-month program has been planned in cooperation with the George Washington University. The first 9 months will be devoted primarily to didactic courses and the last 12 months to clinical experience in selected naval hospitals. Upon completion of the program Nurse Corps officers will be examined by the American Association of Nurse Anesthetists for certification as a Registered Nurse Anesthetist. This is the first program in training nurse anesthetists in which university credit will be awarded for courses in anesthesia.

In the Navy, nurse anesthetists serve with anesthesiologists on the staff of naval hospitals. Often in station hospitals and other medical activities, the nurse anesthetist is the only staff member trained in anesthesia. NC anesthetists compose approximately one-half of the anesthesia staff of the Navy Medical Department.

From the Note BookResearch Assignment Opportunities

Several vacancies are anticipated in Navy Medical Research Facilities in the summer of 1963. Applications are desired from Regular Navy Medical officers interested in and qualified for such assignments. Particular consideration will be given to those interested in the following fields:

- Infectious and parasitic diseases
- Physiology related to thermal stress, respiratory physiology, and cardiovascular physiology
- Metabolic diseases of Naval importance
- Experimental surgery related to trauma, shock, and rehabilitation
- Pharmacology related to psychopharmacology, stress, infectious or parasitic diseases

Letter applications for research assignment should be made to the Bureau of Medicine and Surgery (Attn: Code 7) prior to 1 December 1962 for consideration for assignments during calendar year 1963. The application should cite previous research experience and training, specific interests in a research career, additional training and experience desired, and include a short resume of research projects on which the applicant would like to embark if he considers himself already qualified for independent research.

Reserve Medical officers now on active duty may also apply if they contemplate two or more years of service after 1 July 1963 with the possibility of transfer to the Regular Navy.

Resignations. Attention is invited to SECNAV INSTRUCTION 1920.3C, dated 26 February 1962, concerning voluntary separation policies affecting officers of the Regular Navy and the Naval Reserve. This instruction presents detailed criteria for separation from active duty.

The instruction indicates that the Bureau of Naval Personnel should receive the individual officer's request for separation at least four (4) months prior to the desired release date. This necessary advanced timing requirement is not always obtained because of delays incurred in the chain of command routing. As a result, permanent change of duty orders and other time consuming functions are performed by the assignment officers without knowledge of the forthcoming separation request. It is, therefore, recommended that any Medical Department officer requesting separation submit an advance copy of his request directly to the Bureau of Medicine and Surgery.

—Medical Corps Branch, Professional Div, BuMed

Naval Medical Research Reports

U. S. Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Study of the Value of Free Autogenous Splenic Grafts for Stimulating Communications Between the Mammary Vessels and the Coronary Circulation
MR 005.12-0001.01 Report No. 6, March 1962.

2. Colonization of Six Species of Mosquitoes in Japan MR 005.09-1030.02 Report No. 6, March 1962.
3. Plasmalogens and Phosphatides of Rat Diaphragm after Incubation with Palmitate-1-C¹⁴ In Vitro MR 005.12-1100.02 Report No. 13, April 1962.
4. Human Thermostat MR 005.03-0050.02 Report No. 4, September 1962.

Aviation Medical Acceleration Laboratory, U. S. Naval Air Development Center, Johnsville, Penna.

1. Aerospace Medical Aspects of U. S. Navy Manned Balloon Flight of 4 May 1961 "Strato-Lab High No. 5" MR 005.13-0002.2 Report No. 11, Sept 1962.
2. Data Reduction by Digital Computer MR 005.13-6002.4 Report No. 2, September 1962.

U. S. Naval Medical Research Laboratory, U. S. Naval Submarine Base, New London, Conn.

1. An Unusual Case of Air Embolism Precipitated by Decompression: Report No. 382 MR 005.14-3100-2.06, July 1962.

U. S. Naval School of Aviation Medicine, U. S. Naval Aviation Medical Center, Pensacola, Fla.

1. Design Concepts for Dome Type Helmet Improvements MR 005.13-3100 Subtask 6 Report No. 4, June 1962.
2. Oxygen Cost of Breathing of a Hospital Population Measured with a Simplified Technique MR 005.13-3100 Subtask 8 Report No. 12, June 1962.
3. Eaton Agent: A Review MR 005.09-1204.4.6, September 1962.
4. The Newer Enteroviruses MR 005.09-1204.4.7, September 1962.
5. Natural Reinfestation of Adults by Respiratory Syncytial Virus MR 005.09-1204.4.8, September 1962.
6. Multiplication and Cytopathology of Coxsackie A-21 Virus in Rotated and Stationary Tissue Culture MR 005.09-1204.4.9, September 1962.
7. Studies on the Removal of Embedded Lone Star Ticks, Amblyomma Americanum MR 005.09-0010.2.2, September 1962.

U. S. Naval Medical Research Unit No. 2, Taiwan.

1. Comparison of Colorimetric and Electrometric Methods for Blood pH Determination MR 005.09-1040.1.9, June 1961.
2. Study of Wilson's Disease in Taiwan MR 005.09-1901.2.1, June 1961.
3. Antibiotic and Sulfa Drug Sensitivity of Trachoma Virus Tested in Embryonated Eggs MR 005.09-1201.12.11, July 1961.
4. Development of a Sulfa-Resistant Variant of Trachoma Virus MR 005.09-1201.12.12, July 1961.
5. Cytopathogenic Effects of Inclusion Blennorrhea Virus in Serial Tissue Cultures MR 005.09-1201.12.13, July 1961.
6. Trachoma Virus Isolation Studies on Taiwan MR 005.09-1201.12.19, July 1961.

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DENTAL

SECTION



Common Variation of Normal Occlusion

Irving M. Skolnick, 114-06 Queens Boulevard, Forest Hills 75, N.Y., Normal Occlusion; a Common Variation. New York State D.J. 28:97-105, March 1962. Dental Abstracts 7(8):473-474, August 1962.

Angle's concept of normal occlusion - the "normal relationship of the inclined planes of the teeth when the jaws are closed" - went unchallenged until A. LeRoy Johnson (1920) introduced the concept of variation. Johnson recognized that in dentistry, as in other biological fields, there are variations within the range of normal. He stressed the importance of considering each dentition on its own specific requirements, the ultimate standard of normal being functional adequacy for the person concerned.

Extensive clinical experience has shown that there is a pattern of normal occlusion which manifests spacing in all stages of development of the dentition. This spacing is dependent on certain factors, such as the physiological development of the bones and the musculature.

Recent studies at the New York University College of Dentistry by Guttleman (1961) have shown that there is a type of normal occlusion in which diastemas are present in the dentition.

Clinically, spaces are found to be present in the normal deciduous dentition, not only in the incisor and cuspid regions but often in the molar regions.

Some adults never develop the trituration type of masticatory stroke, but instead manifest an occlusion similar to that found in children. They chew their food with a bilateral vertical masticatory stroke. Studies at New York University under the direction of Samuel Henley indicate that about one-third of the population has this type of occlusion and masticatory stroke. Adults with the bilateral vertical masticatory stroke exhibit some or all of the following characteristics: (1) diastemas, particularly evident in the cuspid region but may be present in any part of the dentition; (2) even alignment of mandibular incisors; (3) ability to move into lateral excursion, but not as a masticatory functional movement; (4) most teeth in almost vertical axial inclination; (5) wide range of vertical overbite and horizontal overbite; (6) mandibular incisors at slightly higher occlusal level than mandibular posterior teeth, and (7) continuity of contact points when the teeth are in occlusal contact, as the teeth of one jaw fit into the spaces between the teeth of the other jaw.

Familiarity with the bilateral vertical masticatory stroke and its influence on the pattern of occlusion in all its clinical aspects will guide the

dentist to intelligent diagnosis in instances where spacing of the dentition is normal and is in no way associated with a pathological variation. Mechanical orthodontic intervention in patients who chew with the bilateral vertical masticatory stroke, to close the diastemas which for the patient are normal, will result only in failure. The spaces will reappear when the appliances are removed. The functional activity of the muscles of mastication give the teeth their positions in the dental arches, and orthodontic movement of the teeth does not change this functional activity.

In most children with large diastemas between the upper central incisors, frenectomy is unnecessary because the central incisors eventually will come together anyway as a result of normal muscle activity in children who develop the trituration masticatory stroke. In the remaining one-third, frenectomies are of no avail since the spaces are the result of muscle function and will persist despite the surgical intervention.

In operative dentistry, it is contraindicated to build out contact points in restorations, inlays or crowns, in patients who chew with the bilateral vertical masticatory stroke.

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Mercurial Poisoning and Sensitivity from Copper and Silver Amalgam Fillings

Lippmann, Dr. Shd. Habroshim 16, Haifa, Israel. Aus Fehlern lernen.
Quintessenz 12:53-54, October 1961. Dental Abstracts 7(8):465-466, August 1962.

Three cases are presented in which mercury from copper and silver amalgam fillings is suspected of causing mercury poisoning or mercury sensitivity reactions. The first patient, a 35 year old woman, was pale and her general condition was poor. She had almost a complete dentition, but the gingiva was swollen with a bluish-red coloring, and the sublingual glands were swollen. Several teeth had large copper amalgam fillings, suggesting the possibility of mercurial poisoning. When the urinary tests not only showed high levels of albumin but also traces of mercury, the diagnosis of "nephritis caused by copper amalgam fillings" was established. The removal of all fillings, extraction of decayed teeth, and the treatment of the gingiva with anti-inflammatory medication resulted in great improvement. The urticaria disappeared, the urine showed gradually decreasing albumin levels, and after 40 days the urine reverted to normal. The patient was seen 10 years later, and she was completely healthy.

The second patient was a robust 40-year-old woman who had an ulcer on the left corner of her mouth which had persisted for 5 years despite medical and dermatological treatment. The urine showed increased albumin values. The ulcer was covered with a thick crust, the removal of which caused severe bleeding. On the mucosa of the cheek from the left corner of the mouth there was a large streak of small gray scalelike structures reaching as far as the third molar. In the lower jaw only the 6 anterior teeth were present plus a

third molar with a copper amalgam filling. The third molar was extracted, but the ulcer was not treated. The ulcer healed spontaneously 8 days later, and completely disappeared within a month.

The third patient was a young, healthy girl who required a filling in one tooth. Because of the previous experience with copper amalgam fillings, the author prepared a silver amalgam filling with a low concentration of mercury. Two hours later the patient's cheek was red and greatly swollen. The silver amalgam filling was immediately removed and replaced by a cement filling. The symptoms of the allergic reaction to mercury slowly disappeared and the patient was well 8 days later.

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Personnel and Professional Notes

Military Symposium to be Held with ADA Meeting. A special program has been arranged for a military symposium on 29, 30, and 31 October by the Navy in conjunction with the Annual American Dental Association Meeting to be held at Miami Beach Convention Hall. The sessions will be held in the Flamingo Room of the Miami Beach Convention Hall. The programs will be made available to all who attend the convention and Dental Reserve Officers who register will receive one retirement point credit for each meeting.

On Monday afternoon, 29 October, RAdm E. G. F. Pollard, DC, USN, will speak on the "Significance of Oral Diagnosis as Related to Treatment Planning" and RAdm Alton K. Fisher, DC, USNR will present "A Review of the Dental Corps Reserve in the Fifty Years of the U. S. Naval Dental Corps."

On Tuesday afternoon, 30 October, Capt Theodore A. Bodine, DC, USNR, will share the program with Capt Evert A. Archer, DC, USNR. Capt Bodine will present "The Basic Concepts of Prosthodontics" and Capt Archer will present "Etiology of Periodontal Disease."

Wednesday, 31 October, Capt Victor J. Niiranen, DC, USN, will speak on "The Dentist in the U. S. Marine Corps." Various demonstrations of Marine Corps dentistry will be made at the American Dental Association Meeting and this will be a timely presentation.

This program of prominent and excellent speakers has been arranged to help celebrate the Dental Corps' Fiftieth Anniversary, and all are encouraged to attend these military sessions.

For those arriving at Miami Beach on or before Saturday 27 October, special attention is called to the meeting of the Council on Federal Dental Service to be held in the French Room of the Fontainebleau Hotel at 0900 of that date. This assembly is concerned with Military Dentistry and Civilian Defense and has become a pre-convention feature of the American Dental Association. It will be exceptionally informative and presented by speakers who are expert in this subject. It should be of special interest to Dental Reserve Officers.

BuMed Instruction 6750.3. Copies of BuMed Instruction 6750.3, dated 24 August 1962, have recently been distributed to all ships and stations having Dental Corps personnel. This instruction provides information concerning the preventive maintenance and repair of dental equipment and furnishes procedures for accomplishment by dental technicians, general, prosthetic, and repair. An initial supply of Forms NavMed 1434, 1434-A, and 1434-B were also included with the instruction.

The following illustrates the method of utilizing the forms:

ITEM OF EQUIPMENT	OPERATORY #4																								October 1962						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
DAILY MAINTENANCE PROCEDURES																															
ASPIRATOR	<ul style="list-style-type: none"> 1. Flush aspirator hose and change tip after each patient. 2. Clean aspirator bottle after each patient. 																								x x x x x x x x x x x x x x x x x x x x x x x						
DENTAL OPERATING UNIT	<ul style="list-style-type: none"> 1. Clean and lubricate rotary handpieces and attachments in accordance with manufacturer's instructions. 2. Flush saliva ejector hose and c' 																								x x x x x x x x x x x x x x x x x x x x x x x						
*																															
(Material in this column should be in accordance with local requirements and may be imprinted for clerical expediency)																															
MAINTENANCE DENTAL EQUIPMENT - DAILY NAVMED-1434 (7-62)																															

The Bureau is cognizant of the fact that maintenance problems may vary from one dental activity to another and encourages utilization of the forms in a manner most conducive to the activity needs. Comments and suggestions on this subject will be appreciated. (BuMed, Attn: Code 612)

U. S. Navy Dental Corps Continuing Training Program. Recognizing the need for a continuing education program to keep Dental officers of the Navy abreast of the latest developments in dentistry and keyed to a high professional level, the U. S. Naval Dental Corps is offering a series of short postgraduate courses conducted by members of the staff of the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md.

Among the courses to be offered will be Oral Pathology, scheduled for 14-18 January 1963. Recognition and treatment of oral diseases are based on knowledge of clinical characteristics and understanding of disease processes. This course is designed to increase the knowledge of the Dental officer in the fields of oral pathology and oral diagnosis. Developmental disturbances, diseases of the oral mucosa and the jaws, oral manifestations of various systemic diseases, and benign and malignant oral neoplasms are discussed in detail, and their clinical and microscopic characteristics illustrated with slides. Lectures are correlated with case presentations, microscope seminars, and round-table discussions.

The instructor will be Capt H. H. Scofield, DC, USN, diplomate of the American Board of Oral Pathology. Quotas have been assigned to ComOne, ComThree, ComFour, ComFive, ComSix, ComNine, COMPRNC, COMSRNC, and CNATRA.

This short course is open to active duty career Dental officers of the Armed Forces in accordance with quotas established by the Bureau of Medicine and Surgery.

Applications should be received in the Bureau as early as possible and preferably, not less than 4 weeks prior to commencement of the course. The Bureau Professional Advisory Board will make recommendations on all requests, and upon approval by the Surgeon General, applicants will be notified as to the final action. Those approved will be nominated for TAD or authorization orders, as appropriate. Accounting data will be forwarded to individual officers nominated for TAD orders. Staff Dental Officers not utilizing assigned quotas should report this information to BUMED, Code 6111, one month prior to the convening date of the course. This will allow the Bureau to fill the quota from other districts.

Change of Command at NDC, Yokosuka. Capt Donald E. Cooksey, Dental Corps, USN, relieved Capt Robert D. Wyckoff, Dental Corps, USN, as Commanding Officer, U. S. Naval Dental Clinic, Yokosuka, Japan, on 4 September 1962, during ceremonies at U. S. Fleet Activities, Yokosuka. Capt Wyckoff has been the Dental Clinic Commanding Officer since September 1959. Capt Cooksey reports to Japan from duty at the U. S. Naval Dental School, NNMC, Bethesda, Md. The Yokosuka Dental Clinic is one of 11 Naval Dental clinic commands of the U. S. Navy.

Newly Standardized Dental Items.

FSN	Nomenclature	Unit Issue	Unit Price
6530-754-0421	Envelope, Sterilization, Paper Self Sealing, 500s	Pkg	4.70

AVIATION MEDICINE DIVISION



Doctors*

By Vice Admiral Fitzhugh Lee, USN, Chief of Naval Air Training.

Several years ago the Department of Defense made a survey to see how officers of the Armed Forces were held in public esteem as compared to people of other professions. As I recall it, the survey showed that military officers ranked sixth, the lawyers were ahead of them, and the list was headed by the doctors. This seems to show that military officers as a whole can do some things to improve their prestige in the public eye, and that we are lucky to have in the military so many members of the profession which stands at the top. Certainly anyone who has the vaguest appreciation of what our doctors undergo—long years of detailed study and preparation, often accomplished at great personal sacrifice—cannot but admire their fine accomplishment, determination and dedicated service.

A previous issue of DOPE pointed out some of the problems of the doctors in the Navy—there just aren't enough doctors and some people tend to be inconsiderate in their demands upon them perhaps, in part, just because their services are "free."

There are two more points worth mentioning. These have to do with the job of the flight surgeon and the lack of indoctrination in military matters which doctors receive when they enter the Navy.**

The role of the flight surgeon is often not well understood in the Navy as a whole, not even in some naval aviation commands. His basic job is to make sure that active naval aviators are in the best possible physical and psychological condition when they fly. This job is handled best when the flight surgeon is attached to an air group or a squadron and concerns himself almost exclusively with the job of seeing that the pilots in his outfit are in tip-top shape to do their job. The fact that we had flight surgeons doing just this in World War II and in Korea contributed tremendously to the outstanding success that naval aviation achieved in those wars.

The flight surgeon is not a specialist in one particular medical field—such as heart, eye-ear-nose and throat, physiology, psychology or psychiatry—he is a specialist in all of these fields as they apply to the man in the cockpit of

* This original article by Admiral Lee appeared in the Naval Air Training Command's monthly publication, "CNATRA DOPE," for July 1962. Appreciation is expressed to the Admiral for permission to re-publish the article in this issue of the USN Medical News Letter. —Editor.

an airplane or the capsule of a satellite. He must be an expert in oxygen systems, personal survival equipment, and contribute to continuing improvement in their quality and design. He must set the standards for flight safety programs and keep an eagle eye on how they are being carried out. He must know the pilots, the aircrewmen and their families; he must fly, work and play with them. He must spend a lot of time with the men on the "line" and the pilots in the ready rooms, even if it be doing nothing more than to "shoot the breeze."

These things he can still do in fine fashion if he is attached to a deployed air group, but often on a shore base these days he finds things a bit different. Due to the chronic shortage of doctors, he is more often than not integrated into an air station's medical department. There he spends most of his time holding routine sick calls for enlisted men, officers, and dependents while performing collateral duties inherent in any naval medical department. His flight surgeon training is virtually "grounded" for lack of time to engage in it. Some of this cannot be helped due to the doctor shortage but flight surgeons at some of our stations still manage to spend some time with individual training squadrons. This may be due to the determination of the individual flight surgeon to carry out his primary responsibilities "in spite of" collateral assignments. It may also be through the help of his senior medical officer who recognizes his status and with the blessings of the commanding officer lets him do more of his flight surgeon work. Commanding officers of air stations and our training squadrons might well take a look-see at their setups and see if they can do something to help out the flight surgeon and encourage him in his work in spite of the admitted difficulties and handicaps which now beset us. The flight surgeons need this encouragement and it would help in making more of them adopt a career in the Navy.

Our flight surgeons in the Navy are trained at the School of Aviation Medicine in Pensacola—a component of the Naval Aviation Medical Center under the command of Rear Admiral Langdon C. Newman, MC, USN. The School is presently headed by Capt C. P. Phoebus, MC, USN, who is a Naval aviator and a flight surgeon. The School has been training flight surgeons and aviation technicians for 23 years, and is now accelerating its long standing research in vertigo, disorientation, etc., to support the problems which NASA is encountering in sending a man to the moon. NASA especially picked our School of Aviation Medicine for this role because of our long and successful work in the field. The quality of the School's work would appear to be well attested also by the fact that the U. S. Army looks to it for training Army flight surgeons.

The course requires 5-1/2 months and the School runs three classes a year, averaging 45 officers each. A few highly qualified student flight surgeons are permitted to take the full flying course and to receive a designation as a naval aviator. Approximately 1 of these is trained each year with a maximum ceiling of 20 allowed by CNO. The remainder are given a flight surgeon's (observer) designation and receive approximately 32 hours of flying in a familiarization program. If physically qualified they are permitted to solo

in the T34 and all have some familiarization in the T2J, SNB, HTL-6, and HSS-1.

When the student flight surgeons report to Pensacola, frequently from internships at civilian hospitals, they have averaged 8 years of college and post-graduate work in the fields of medicine. On reporting, they have just been commissioned as lieutenants, U. S. Navy or Naval Reserve. The great majority of them have had no military or naval indoctrination whatsoever before reporting. At Pensacola we give them this indoctrination by giving them the initial 2 weeks of the School of Pre-Flight. They appear to appreciate the chance to get this naval indoctrination which most doctors who are not in the flight surgeon program do not receive. The latter, lamentably, is probably just one other aspect of the doctor shortage. They are so much in demand that the time can't be spared to send them to OCS for indoctrination.**

In any event, a young doctor may report to one of our commands who has not had the flight surgeon's course. He may well be among those who have just put on the uniform for the first time. Many line officers do not realize that most of our new doctors are thus rather ill prepared to understand and face the responsibilities placed upon them as lieutenants, U. S. Navy. We may be impatient with them, not realizing that some of their mistakes stem from a lack of knowledge of some of the naval facts of life. It would be helpful if the commanding officer could give some personal indoctrination and provide in the command for some sort of "do it yourself" naval indoctrination program for these officers. It would help the doctors to do their job better, it would help the Navy, and it would perhaps—because they would understand it better—encourage more of them to adopt the Navy as a career. This we urgently need. After all, they stand at the top of the prestige list and we want these prestigious people!

** NOTE: Admiral Lee has brought forth some valuable points which, doubtlessly, have been and will continue to be given serious consideration in training plans for new medical officers. For a number of years, commencing in July, 1956, as many medical officers as possible who were reporting to their first active U. S. Naval duty were issued TAD orders for 2 weeks of intensive "Naval Orientation and Indoctrination." For this purpose, a formal and standardized curriculum (with supporting training aids) was prepared and issued by BuMed. These new officers were channelled more or less according to geographic location to the following U. S. Naval Hospitals which conducted the training program: Chelsea, Mass., St. Albans, N. Y., Philadelphia, Penna., Portsmouth, Va., Great Lakes, Ill., and Oakland, Calif.

In recent times, however, it became increasingly evident that, because of the larger workload in naval hospitals, this program could not be supported as well as at the time of its inception. Also, the major emphasis in the indoctrination was, of necessity, along the military aspects of medicine, since many of the doctors were needed in independent or remote operational assignments. Moreover, it was felt that the strictly military phase of the training—to make them fully aware of their responsibilities as naval officers—

could best be given by line officers, with the Medical Department lending its support for the military medical aspects.

Now, it is a pleasure to submit the following progress and status report from the Professional Division, BuMed (a quotation from the USN Medical News Letter of 21 Sept 1962 - Vol. 40, No. 6, page 19):

"In 1962, for the first time, through the combined efforts of the Chief of Naval Personnel, Chief of the Bureau of Medicine and Surgery, the Commanding Officer, U. S. Naval Officer Candidate School, Newport, R.I., the Commanding Officer, U. S. Naval Hospital, Newport, R.I., and the Staff of the Commander, Cruiser Destroyer Force, U. S. Atlantic Fleet, a formal indoctrination course was established at OCS Newport, R.I. The curriculum was designed to acquaint newly reporting officers with the responsibilities of a naval medical officer and to furnish indoctrination into the military aspects of Navy life. There were 44 officers in attendance at the 3-weeks course.

The course was well received by the students who had only high praise for their instructors. It is planned that next year this training at Newport will be expanded to include more indoctrinees and, it is hoped that a similar course can be established on the West Coast."

—Editor.

* * * * *

Physiological Studies of the Wet Type Exposure Suit for Flight Personnel

The following studies report some initial tests utilizing the "wet suit" as an exposure garment for flight personnel in which naval aviators were the subjects. The clothing for each test consisted of long cotton underwear, wet suit torso with arms, summer flight suit, intergraded torso harness suit, flight boots, APH-5, and MK 3C flotation garment. Each test consisted of sitting in the aforementioned clothing in a 64° F room for fifteen (15) minutes and then a one (1) hour flight in flight simulator in which the cockpit temperature was 60° F \pm 2° F. This was followed by entering the pool (water temperature 65° F) and the flotation characteristics investigated.

A proper fit of the "wet suit" was found to be critical, for if slightly too small the discomfort factor was excessive. Although the suits are supplied in standard sizes, it is comparatively easy to modify these sizes in order to obtain a proper fit. All pilots commented that one (1) hour in the suit was about all they would want to tolerate because of body heat build-up. Average weight loss during the 1.25 hours in the suit was 2.2 pounds \pm 0.2 pounds. Average body temperature rose 1.3° F \pm 0.2° F. Pulse and respiratory rates were elevated, but not significantly. Blood pressure measurements were quite varied, some showing a rise in both systolic and diastolic, others a fall in both, but none were dramatic and the pulse pressure remained fairly constant. Three (3) of the pilots developed a rash. In two (2) pilots the rash was mild and localized under the arms and in the crotch. In one (1) pilot the rash was generalized.

It was also noted that the "wet suit" was a fairly fragile garment and considerable care had to be taken in donning and doffing.

In the water the suit per se afforded little or no flotation qualities and without an inflated flotation garment seven (7) of the nine (9) pilots sank below the surface. In simulating unconsciousness the "wet suit" had a tendency, in most instances, to cause face down flotation characteristics.

From this limited investigation, it appears that the suit has the following areas which are unsatisfactory: body heat production excessive for periods over 0.75 hours; suit fragility; flotation characteristics; and the production of dermatitis.

Further studies are being made.

* * * * *

A Philosophy of Refraction for Aviation Personnel

Cdr W. L. Erdbrink MC USN, Chief, Ophthalmology Division, U. S. Naval School of Aviation Medicine, U. S. Naval Aviation Medical Center-54, Pensacola, Fla., 10 August 1962.

In aviation medicine, a cycloplegic refraction is performed to gain base-line data on candidates for flying and in the evaluation of designated aviators who have defects in unaided visual acuity. In these situations, a philosophy should be adopted which is consistent with the basic mission of a flight surgeon - "Keep them flying." Also, the reverse of the clinical refraction should be borne in mind: "Push the Plus - Think Positively," or "Accentuate the Positive" on the candidates for flying; "Eliminate the Negative" on designated aviators.

The mission of the flight surgeon refractionist is not to "sell" glasses to flying personnel. In fact, such glasses may "shoot him down" in a very short time.

Since the candidate for flying must have 20/20 unaided vision in each eye and can have no myopic meridian under cycloplegia, the plus must be pushed in this "administrative refraction." Usually we are dealing with small errors of refraction, and this places the greatest demand upon the refracting skills of the flight surgeon. The following are some practical suggestions for this oft times difficult and judgement-demanding refraction:

(1) Use enough of the standard cycloplegic drugs to gain maximum relaxation of accommodation (Case 1).

(2) Start the refraction at the proper time interval after instillation of the cycloplegic drug.

(3) Be aware that the individual may be reflexively "fighting" the cycloplegia and is accommodating. He will have a markedly fluctuating visual acuity in response to small sphere lens changes; will "run you up and down and around" with the cross-cylinder; will give reverse answers on the astigmatic dials; and will "eat-up" the minus on the red-green end-point test. Nothing seems to check out or be right.

- (4) No cycloplegic drug is 100% effective; there is always some residual accommodation.
- (5) Believe Your Retinoscopy!
- (6) The Lancaster-Regan Astigmatic Dials may give better answers when dealing with small cylinders.
- (7) Have several different visual acuity charts in the refracting lane - "DEFPOTEC" is known by most intelligent candidates.
- (8) When refining the axis and power of a cylinder using either the Jackson Cross-Cylinder or the astigmatic dials, keep the individual fogged - 20/30+ to 20/25 - vision is the check.
- (9) Keep the maximum plus sphere correction in place to gain a vision of several letters in the 20/15 line to make up for any missed letters in the 20/20 line. This of course, is after Sturm's conoid has been collapsed, and best vision is the goal.
- (10) Remember that a +0.50-0.50 x 180 qualifies for SNA, but a +0.25-0.50 x 180 does not (Case 2).

For a designated aviator in Service Group I with unrestricted flying, 20/30 vision in each eye is permitted. This permits about a spherical equivalent of -0.50 diopter of myopia to continue flying. Therefore, under no circumstance ever give any type of glasses to a Service Group I Aviator regardless of complaint, circumstance, or situation. (Presbyopia is the only exception.)

When a designated aviator is encountered with less than 20/30 vision in an eye, think before you prescribe and change his service group status. The following are some practical suggestions to be considered when an aviator's career may be affected because of defective vision and his service group status is changed.

- (1) Never hesitate to ask for assistance. Have several different flight surgeons perform several cycloplegic refractions prior to the reporting of the findings to BuMed.
- (2) "False myopia" exists for many reasons - is not cured by myopic lenses and is even made worse by them.
- (3) Ciliary body spasm or spasm of accommodation is the commonest cause of pseudo - or false myopia in the Service Group I age population.
- (4) The pilot in his 20's, who was plano several years previously, may become truly myopic due to the normal growth curve of the eye (Case 4)
- (5) A good cycloplegic retinoscopy is the simplest method of diagnosing ciliary spasm and false myopia.
- (6) Psychiatric, personality or situational influences may cause false myopia (Case 3).
- (7) In the older Service Group I pilot, incipient diabetes, early glaucoma, premature presbyopia, and incipient lens changes of cataract are a few organic causes of false myopia (Case 5).

It is the opinion that no designated aviator should have his service group status changed because of defective visual acuity without a complete ophthalmologic evaluation. Cycloplegia, the slit-lamp, the ophthalmoscope,

the Schiotz tonometer, blood glucose determinations and/or the NP interview may make the true diagnosis other than myopia.

The indiscriminate prescribing of myopic lenses in aviation is to be condemned. An over-corrected myope is made falsely hyperopic and his unaided vision deteriorates because of excessive accommodative effort. This is even more true in the false myope with further spasm of accommodative effort.

The flight surgeon refractionist should qualify the candidate by crowding on the plus lenses and should keep the designated aviator flying in Service Group I by eliminating the minus lenses. In "private practice," the pushing of plus and holding off on the minus makes for unhappy clients. We are not in private practice to please the client. We in aviation medicine are to keep them flying as well as to keep them seeing without glasses. We have a great responsibility on our shoulders when we refract candidates for flying and designated aviators with visual acuity defects.

Case Reports

Case 1. A 21 year old Ensign, SNA, was evaluated in March, 1962, being referred by the Aviation Examining Room with a recorded Plano refractive error in each eye. Our refraction revealed +0.75 sphere under cycloplegia. When he was informed that he would be unable to read for 24 hours because of the drops, he stated that this didn't happen aboard ship when he was examined.

Comment: A well-meaning flight surgeon is using "Mydriacyl" and with this drug, the refraction must be performed within 20-30 minutes after instillation. Our refraction proved that this young SNA truly "had money in the bank" with a +0.75 sphere vs a Plano error.

Case 2. A 21 year old Pfc., USMC was disqualified for flight training with this refraction: O.D. Plano, O.S. +0.25-0.50 x 165. Due to the candidate's own insistence, an ophthalmologist-flight surgeon found O.D. +0.50 sphere, O.S. +0.75-0.25 x 110. We verified the latter refraction on this MarCad, one year later.

Comment: One candidate was saved for flight training, not by the flight surgeon, but by the candidate's desire.

Case 3. A 27 year old LT(jg), P2V pilot was evaluated in March, 1962, being ordered to appear before the Special Board of Flight Surgeons because of myopia. As an AOC in 1957, the recorded cycloplegic refraction was O.U. +0.50-0.50 x 90. In February, 1961, the VOD was 20/40 with -0.75-0.25 x 105 and VOS was 20/30 with -0.50-0.50 x 10 = 20/20 O.U. In October, 1961, the VOD was 20/70, VOS 20/30 with the same basic error. In January, 1962, VOD was 20/60, VOS 20/80, again with the same basic error. Our cycloplegic evaluation in March, 1962, after leaving the minus corrective lenses off for 4 days was, VOD 20/30 with Plano -0.50 x 100 = 20/20, VOS 20/25 with -.025 sphere = 20/20. He was returned to Service Group I and was instructed to wear no corrective lenses.

Comment: It is obvious that the unaided visions here were like a "yo-yo" and did not correlate with the refractive findings. Obvious ciliary spasm

was present and a neuropsychiatric consultation reported a "compulsive doubter" personality type. The poor vision in the past related to specific events in his personal life - marriage, augmentation, et cetera.

Case 4. A 26 year old LT(jg), AD pilot was evaluated in February, 1962 for myopia. As a candidate, at age 21, his refraction was recorded as plano in each eye. Now, 5 years later, VOD 20/30, VOS 20/40, O. D. -0.50, O. S. -0.75 sphere. He had been wearing -1.00 spheres O. U. He was found qualified for Service Group II.

Comment: This is probably a normal growth curve for developing myopia, but the over corrective lenses did not help the situation.

Case 5. A 39 year old LCDR transport pilot was evaluated in February, 1962, for myopia. As a candidate in 1942, the recorded refraction was +0.50 sphere O. U. In 1962, he was placed in Service Group II because of VOD 20/30 with $-0.50-0.25 \times 90 = 20/20$, VOS 20/50 $-0.50-0.75 \times 90 = 20/20$. Our refraction showed $+0.25-0.50 \times 90$ O. U. After removing his glasses for 4 days, the unaided vision was 20/20-2 in each eye. A glucose tolerance test showed latent diabetes.

Comment: Here is a case of "false myopia" and the blood sugar levels may account for the defective and fluctuating vision. Eye-wise, he was Service Group I, but the chemistry diagnosis of diabetes nullified our recommendation.

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Principles Concerning Pilot Performance in Centrifuge Simulations of Space Vehicles

R. M. Chambers and J. G. Nelson, Human Factors Branch, Aviation Medical Acceleration Laboratory, U. S. Naval Air Development Center, Johnsville, Pa. ARS Journal, pp. 1534-1541, November 1961.

Three major types of space vehicles have been simulated on the Johnsville human centrifuge, each giving a different direction to the G (gravity) vector with respect to the pilot's body. In Type I, a high drag, variable lift winged vehicle, the pilot is forced down into his seat (+G_Z). In Type II, a high drag capsule, he is forced back into his seat or couch (+G_X). In Type III, a glide capsule, he is forced forward against his harness (-G_X) and down into his seat. During the simulation, these accelerations are produced by a centrifuge with a 50 ft. arm. The pilot's control motions are fed back into the control system computer, forming a "closed loop," and allowing the pilot to "fly his instruments," or even "fly instruments and centrifuge."

Sensations reported by subjects in these simulations vary with the vehicle. Type I Vehicle: pressure on buttocks; heaviness of head, body, and limbs; congestion in lower segments; greyout or blackout; pain in legs or toes; breathing difficult and tiring. Type II Vehicle: pressure on chest with possible substernal pain; vision blurred and restricted; eyes difficult to keep open; fatigue; difficulty in breathing. Type III Vehicle: fullness and pain on face, arms, and

legs; pressure points on chest and face supports; blurring of vision; congestion in nose; ease of breathing. In attempting to establish performance tolerance limits within the physiological tolerance limits, tasks involving control, monitoring, troubleshooting and communicating have been presented to pilots in these closed loop simulations.

Acceleration may affect performance by acting directly on receptors, by acting directly on body members, by affecting the nervous system, or by a combination of any or all of these. Some of the conclusions which have been reached in the various experiments are formulated here as general principles.

Performance Tolerance: Performance tolerance limits, which are usually reached before the physiological tolerance limits, must be defined as the end points for the reliable functioning of a particular performance ability system. These performance tolerance limits may only be determined in a specific context of task proficiency required, restraint system provided, and characteristics of pilots tested. Under moderate acceleration, pilot performance may improve. At high G, performance deteriorates markedly, reflecting an impairment of vision, and inability to breathe, strain, or resist physiologically the effects of acceleration. Under high $\pm G_x$, the performance tolerance limit on a control task requiring maintainence of flight path angle and attitudes in three axes was found to be between ± 13 and $\pm 15 G_x$. At this G level, the pilots were experiencing major physiological stress, and had great difficulty in breathing and seeing the panel instruments.

Practice Effects: Major increments in performance proficiency in high G environments occur as a function of practice. Practice results in physiological conditioning and adaptation, as well as learning to make performance compensations for the acceleration disturbances.

Restraint System: Improved restraint systems may double the performance tolerance limits. For one performance task, advanced restraints changed the limits from -3.5 or $\pm 6 G_x$ to -6 or $\pm 12 G_x$. In another study, using levels of $\pm G_x$ and $\pm G_z$ at which acceptable performance could be maintained for only 1-2 minutes, the time tolerance to acceleration was extended to 3-5 minutes by use of improved restraints.

Individual Differences: Major individual differences exist among pilots in their ability to tolerate high G, due to differences in piloting, breathing and straining techniques, differences in ability to tolerate pain and motion, and differences in motivation.

Control System: The control device which the pilot uses in performing his flight task may seriously limit performance tolerance to acceleration. Side-arm controllers (as opposed to center sticks) tend to increase performance tolerance, and the optimum controller configuration will differ for different acceleration fields.

Control Feedback: Acceleration impairs the ability of the pilot to sense control characteristics such as dead band, breakout force, control friction, damping and stick force gradients.

Task Difficulty Level: Changes in task difficulty level which have little effect on static performance may seriously impair performance under high G.

A visual display system which is relatively undemanding under static conditions may place excessive requirements upon vision under G. Likewise, a system adequate in one G field may be inadequate in another. Under high G, vision may be disturbed by inadequacy of blood supply to the retina, mechanical forces on eyes and associated structures, and the accumulation of tears. Differences in magnitude, duration and direction of G are reflected in differences in kind and degree of symptoms.

Higher Mental Processes: Higher mental functioning appears to be affected by accelerations at levels below those which cause unconsciousness. Time judgement and estimation are affected by moderate acceleration, but much further research is required to similarly determine the effects of acceleration on other higher mental processes.

These principles are based on research where the primary variables were magnitude and direction of G force. Further research is needed to investigate the effects of rate of onset and decline, duration of peak G, angular acceleration, lateral G, and the interactions between these independent variables.

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RESERVE



SECTION

Board Certifications

The Reserve Division, BuMed is pleased to announce that the following Medical Reserve Officers (inactive), have attained Board certification:

American Board of Anesthesiology:

LT Peter Chodoff, MC, USNR
LCDR Glen E. Eaton, MC, USNR

American Board of Dermatology:

LT Elias W. Rosenberg, MC, USNR

American Board of Internal Medicine:

LT Robert L. Gillett, MC, USNR

American Board of Obstetrics and Gynecology:

CDR James P. T. Pauly, MC, USNR
LT Anson H. Stage, MC, USNR

American Board of Orthopedic Surgery:

LCDR John L. Barnard, Jr., MC, USNR

Board Certifications (continued)

American Board of Pathology:

LCDR Donald H. Souilliard, MC, USNR
LT Frederick W. Sunderman, Jr., MC, USNR (in Clinical Path)

American Board of Pediatrics:

LCDR Martin J. Bukowski, MC, USNR
LCDR Richard F. Greathouse, MC, USNR
LCDR William L. London IV, MC, USNR
LCDR Paul G. Quie, MC, USNR
LT John W. Sessums, Jr., MC, USNR
LT Robert L. Summitt, MC, USNR

American Board of Preventive Medicine:

LCDR John S. Anderson, MC, USNR

American Board of Surgery:

LT William J. Barrison, MC, USNR
LCDR Arthur C. Beall, Jr., MC, USNR (also Bd Thoracic Surg)
LT Lawrence W. Greene, Jr., MC, USNR
LCDR James P. Johnston, Jr., MC, USNR

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THE BERRY PLAN

Armed Forces Physicians' Appointment
and Residency Consideration Program (Part IV)
(concluded)

16. Will I have a reserve obligation upon completion of 2 years of active military service? Individuals who accept a reserve appointment (i. e., sign the oath of office) before attaining the age of 26 will have a reserve obligation under the provision of Section 651(a) of Title 10 of the United States Code. This consists of 2 years of active military service, 3 years in the ready reserve (this obligation is being fulfilled while participating in residency training), and 1 year in the standby reserve. Time spent in commissioned reserve status, including inactive time awaiting entry on active duty, counts toward the total 6 year obligation of individuals who are commissioned prior to reaching age 26. The factor determining your obligation under the law is your age at the time you accept a reserve commission (sign the oath of office), regardless of the date you actually enter on active duty. The military departments require that reserve appointments be accepted or declined within 30 days of the date of tender and will not waive this requirement for the sole purpose of permitting an individual to avoid the provisions of this law.

17. How is the Department of Defense mailing list for distribution of information bulletins and forms compiled? Each medical school gives the Department of Defense the names and address of internship of graduating medical students. The names of students who are participating in Armed Forces programs which require active duty following internship (see question 9) and students who are commissioned in the U. S. Public Health Service are deleted. All others are mailed the information bulletin and application form (SD Form 249).

18. When will I be notified of my active duty assignment? The military departments issue active-duty orders from 60 to 90 days prior to the month in which the individual is scheduled for duty.

19. What chance do I have of being selected for residency training? That will depend upon the number requesting deferment consideration in the program. Each specialty will be considered separately, and selection will be by random choice within the specialty. The following table shows the percentage of applicants selected in the various specialties in the program for 1961 graduates:

Specialty	Per Cent	Specialty	Per Cent
Allergy.....(no applicants)		Child Psychiatry	100
Anesthesiology.....	100	Pulmonary Disease... (no applicants)	
Aviation Medicine	100	Radiology.....	100
Cardiology.....	100	General Surgery.....	100
Gastroenterology.....	100	Obstetrics & Gynecology ..	81
General Practice.....	100	Urology.....	74
Neurology	100	Research.....	72
Occupational Medicine...(no applicants)		Dermatology.....	62
Otolaryngology.....	100	Internal Medicine.....	59
Pathology.....	100	Orthopedic Surgery.....	50
Pediatrics.....	100	Ophthalmology.....	42
Physical Medicine.....	100	Plastic Surgery.....	36
Preventive Medicine.....	100	Thoracic Surgery.....	35
Psychiatry.....	100	Neurosurgery	29

20. May I be assured of deferment for the years of residency training required to complete my specialty board certification requirements? If you are selected for deferment, every effort will be made to have your deferment continued until you complete your board requirements. Continued deferment is contingent upon your desires, your acceptability to the hospital, and the needs of the Armed Forces.

21. May I be deferred to complete psychoanalysis following residency training in psychiatry? No. Deferment may be approved only for the time required for completion of a residency in psychiatry.

22. Is it possible to be deferred for 4 or 5 years of residency training? Yes. Individuals selected for residency training in established 4 or 5 year programs may be recommended for deferment for a fourth or fifth year

if selected for continued training by the hospital concerned.

23. I was selected for deferment in psychiatry. I have now decided I want a residency in ophthalmology. May I change my specialty and remain in the program? No. Changes in specialty will not normally be permitted after selections are made. Selections are made on the basis of requirements. These requirements are carefully calculated and must be filled.

24. My residency will not begin until 1 January 1964. If I accept this residency may I be recommended for deferment? Yes.

25. I have applied for a civilian residency which obligates me for additional service upon completion of my residency training. May I be deferred? No. To be eligible for deferment consideration you must be available for military service upon completion of your residency training or termination of your deferred status.

26. Is there an age limit for participation in the residency deferment program? Yes, you must complete residency training before attaining age 32.

27. I am already in residency training but am not a participant in the Berry Program. May I apply now for deferment to complete my training? The current program is open only to interns. However, you may write directly to the service of your choice (Surgeon General of the Army, Navy, or Air Force, Washington 25, D. C.) regarding a Reserve commission and deferment to complete your training. Acceptance will depend upon whether or not there are drop-out vacancies in your specialty at your level of training, and will be contingent upon your not having received a Selective Service induction notice prior to the time you sign an Oath of Office as a commissioned officer.

Dates to Remember

1 December 1962	Deadline for submitting application for commission to the sponsoring service.
1 March 1963	Deadline for obtaining residency and submission of "Request for Residency Training and Hospital Agreement" (SD Form 247).

Please Note: Correspondence concerning your assignment, the status of your application for commission, and the time of call to active duty should be addressed to the military department to which you have been allocated.

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NMRI Hosts Public Relations Reserve Company

The U. S. Naval Reserve Public Relations Company 5-4, commanded by Commander William J. Morgan, accepted the invitation of Captain John R. Seal, MC, USN, Commanding Officer of NMRI, to host their drill meeting of 8 August. This drill was in keeping with their overall training program to further increase their knowledge of the Navy's current operations and its research and development programs. After a short historical review by Commander Leo A. Jachowski, MSC, USN, the group was escorted on a tour of the various projects.

Date of Remembrance

I December 1963
Describes for commanding officer
sabbatical for commission
to the Spouse service.

I March 1963
Describes for desiring
residence and administration of
"Resident for Residential Training
and the Hospital Agreement"
(SD Form 542).

Permit No. 1048

Official Business

Date may be applied for Commission
and the time of
posting to the military establishment
or the service.

BETHESDA 14, MARYLAND
NATIONAL NAVAL MEDICAL CENTER
U. S. NAVAL MEDICAL SCHOOL
NAVAL DEPARTMENT
POSTAGE AND FEES PAID
DEPARTMENT OF THE NAVY
